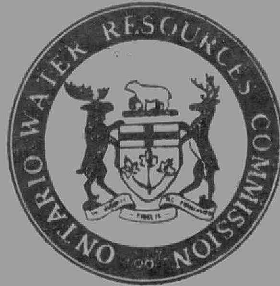


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O. W. R. C.
Water Pollution
Survey

THE
ONTARIO WATER RESOURCES
COMMISSION



WATER POLLUTION SURVEY
of the
VILLAGE OF KILLALOE STATION
COUNTY OF RENFREW

1969

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THE
ONTARIO WATER RESOURCES
COMMISSION
Report on a
Water Pollution Survey
of the
VILLAGE OF KILLALOE STATION
in the
COUNTY OF RENFREW
DIVISION OF SANITARY ENGINEERING
DISTRICT ENGINEERS BRANCH
1969

REPORT ON A WATER POLLUTION SURVEY

OF THE

VILLAGE OF KILLALOE STATION

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WATER POLLUTION SURVEY
OF THE
VILLAGE OF KILLALOE STATION

INTRODUCTION

A water pollution survey was conducted in the Village of Killaloe Station on July 9, 10 and 11, 1969. Such surveys are performed by this Commission for the purposes of locating and recording sources of existing and potential water pollution. Where these sources are noted, recommendations concerning abatement are made to the appropriate parties.

This survey also included an assessment of ground-water quality within the village.

PREVIOUS SURVEY

A similar survey was performed by staff of this Commission in 1965. It revealed several existing and potential sources of water pollution, and indicated the presence of contamination in a number of private wells. The survey presented the following recommendations:

"1. Efforts to realize the establishment of a municipal water works and sewage works system in the Village of Killaloe Station should be continued."

"2. It should be ensured that drainage from the floor drain at the White Rose Service Station does not adversely affect the quality of the storm sewer discharge."

With regard to the first recommendation, proposals

for both water and sewage for the village are currently being developed under the Provincial method of financing. With regard to the second recommendation, phenolic wastes are reportedly still being discharged by the service station to the storm sewer.

THE VILLAGE OF KILLALOE STATION

General

The Village of Killaloe Station is located at the western end of Golden Lake, in the County of Renfrew. It lies on Highway 512, just south of the easterly junction of Highways 60 and 62. The 1968 assessed population was 853. (Municipal Directory).

Water Supply

Water is obtained from private drilled and dug wells. In a number of instances, several neighbours share wells.

Sewage Disposal

Sewage disposal is effected on a private basis, principally through the use of septic tanks and subsurface tile beds. Some households utilize privies. Odours reportedly arising from several village drainage courses during warm dry weather indicate that these drains are receiving discharges of sewage either directly or indirectly.

Discussions with local health officials revealed that insufficient soil cover presents difficulties in the installation

of adequate septic tank systems. In the older areas of town, minimal lot sizes are often encountered.

Surface Drainage

The major drainage course for the town is Brennan Creek, which flows in a northerly direction through the village and into Golden Lake approximately two miles to the east. Surface water reaches the creek within the village by means of natural drainage ditches, improved ditches, and municipal storm sewers,

Industry

There is no major industry in the Village of Killaloe Station.

Refuse Disposal

The municipal refuse disposal site is located approximately one mile south of the village. Regular burning and landfill procedures are carried out. A visual inspection of the site did not disclose any existing or potential hazards to water quality.

Recreation

It was reported that Brennan Creek is used for swimming to some extent in the village.

CONDUCT OF SURVEY

The survey consisted of a review of pertinent Commission files, discussions with municipal and Health Unit officials, sampling of wells and watercourses within the village, and visual

observations.

Warm weather prevailed throughout the survey, except for some rain during the evening of July 9 and the morning of July 10.

Chemical determinations of samples were performed at the Ontario Water Resources Commission Laboratory in Toronto, as were the examinations of those bacteriological samples obtained on July 11. Bacteriological samples collected on July 9 and 10 were examined at the Ontario Department of Health Laboratory in Ottawa.

The following chemical determinations were performed on the samples of surface drainage: BOD, solids, ABS, and phenols. The foregoing plus complete nitrogen and phosphorus analyses were made on samples obtained from Brennan's Creek. The chemical analyses of well samples included tests for hardness, alkalinity, iron, chloride, pH, and fluoride.

The bacteriological examination consisted of enumerations of coliform organisms, both total and faecal.

An explanation of the various terms mentioned above and of the significance of the test results is given in the Appendix.

The OWRC objectives for BOD and coliform organisms in surface waters are maximums of 4.0 ppm and 2400 organisms per 100 ml., respectively.

RESULTS OF SURVEY

The laboratory results of the samples obtained during the survey are presented in Appendix "A": Table I being the general surface water sample results; Table 2 being the nutrient analyses of the surface water samples and Table 3 being the well sample results.

The significance of the laboratory analyses are described in Appendix "B". A map of the village showing the sampling locations is also appended.

DISCUSSION OF RESULTS

Surface Water

The reported values indicate that the concentration of BOD in Brennan Creek remained within this Commission's objective throughout the village. Acceptable coliform counts were noted in creek samples obtained above Queen Street. The high counts reported below that point are attributed to discharges from the improved ditches draining to the north and south banks of the creek east of Cameron Street, and to the discharge from the northwest storm sewer outfall at Queen Street. These discharges, which were reported to contain sanitary wastes, were confirmed as pollution sources by the high results for nearly all tests performed.

The ditch draining to the creek at Annie Street, which was also reported to contain sanitary wastes, was confirmed as a pollution source by the test results, however, it did not appear to have a significant effect on the quality of the creek.

It would appear from the above results and from visual observations that the contamination was emanating mainly from that part of the village east of the creek and from the central area of town west of the creek. It would be necessary, however, to conduct a sanitary survey of individual properties in order to confirm this.

No flow was observed in the submerged storm sewer outfall at sample point BOB 50.22 W. It was reported at the time of the last survey that varying quantities of oil were sometimes discharged at this point with floor drain wastes from the adjacent service station. Although test results did not provide confirmation, it is understood that this practice is being continued.

Nutrients

The samples obtained for nutrient analyses on July 9 (Table 2) do not indicate abnormally high levels of nitrogen or phosphorus in Brennan Creek either above or below the Village of Killaloe Station. However, relatively high levels of nitrogen were reported in the samples obtained from the creek at Cameron and Queen Streets on July 10. Since rain had fallen in the interval, these higher levels may have been caused by agricultural runoff or sanitary wastes flushed from ditches and storm drains.

Groundwater

Coliform organisms were found to be present in six, or 33%, of the wells sampled. In four of those sampled, coliforms were present in significant concentrations, thus indicating the probability of contamination by sanitary wastes. The fact that these six wells are located at widely separated points in the village, and that the remainder of wells did not contain coliform organisms, indicates that any contamination reaching them is either of a localized nature or is due to improper well construction.

The chemical samples from both the dug and drilled wells revealed a water which was generally of satisfactory chemical quality, although two samples contained iron in concentrations slightly above the OWRC recommended upper limit of 0.3 ppm. The presence of iron at levels above this objective may lead to problems of staining and taste and odour. Natural Fluoride was present in all wells in concentrations below the level considered optimum for the prevention of dental caries.

SUMMARY

A water pollution survey conducted in the Village of Killaloe Station in July 1969 revealed that sanitary wastes were gaining access to Brennan Creek through local ditches and storm drains.

This may be attributed to both malfunctioning private disposal systems and direct discharges. It would appear that

the majority of such systems are located in the area of the village east of the creek and in the central part of town west of the creek.

Although sample results did not provide confirmation, it is understood that oil is still discharged periodically to the creek by a local service station.

Coliform organisms were present in 33% of the wells tested. Four wells contained coliforms in significant concentrations and thus appeared to be subject to contamination from sanitary wastes. It is not considered, however, that there is a general groundwater pollution problem.

RECOMMENDATIONS

1. Efforts to realize the establishment of municipal water works and sewage works systems in the Village of Killaloe Station should be continued.

2. It should be ensured that discharges from the floor drain at the service station at the corner of Queen and Mill Streets do not adversely affect the quality of the storm sewer discharge.

/jkc

Prepared by:

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APPENDIX "A"

TABLE I

VILLAGE OF KILLALOE STATION

WATER POLLUTION SURVEY - SURFACE WATER SAMPLE RESULTS

SAMPLE POINT NO.	DESCRIPTION	DATE	COLIFORMS per 100ml		5-DAY BOD	S O L I D S			ANIONIC DET.		PHENOLS in ppb
			TOTAL	FAECAL		TOTAL	SUSP.	DISS.	as	ABS	
BOB 48. 87	Brennan Cr. down- stream from Killaloe Station at Henry St. launching area.	July 9/69	11,000+	11,000+	1.4	140	5	135	0.1		2
BOB 49.95 D	Improved ditch drain- ing to the south bank of Brennan Cr. east of Cameron Street	July 10	11,000+	11,000+	9.0	510	70	440	0.6		6
BOB 50.05 D	Improved ditch drain- ing to the north bank of Brennan Cr. east of Cameron Street	July 10	11,000+	11,000+	9.0	2840	2270	570	0.7		10
BOB 50.1	Brennan Cr. at Cameron	July 10	11,000+	11,000+	1.6	190	5	185	0.2		2
BOB 50.14W	Storm sewer outfall to S. bank of Brennan Cr. W. of Cameron St.	July 10				NO FLOW					
BOB 50.2	Brennan Cr. at Queen St.	July 10	260	180	2.0	200	5	195	0.1		5
BOB 50.2 W -(NW)	Storm sewer outfall to Cr. at Queen St. NW side	July 10	11,000+	11,000+	15.0	260	50	210	1.0		30
BOB 50.2 W -(NE)	Storm sewer outfall to Cr. at Queen St. NE side	July 10				NO FLOW					
BOB 50.2 W -(SW)	Storm sewer outfall to Cr. at Queen St. SW side	July 10				NO FLOW					
BOB 50.2 W _(SE)	Storm sewer outfall to Cr. at Queen St. SE side	July 10				NO FLOW					

APPENDIX "A"

TABLE I cont'd.

SAMPLE POINT NO.	DESCRIPTION	DATE	COLIFORMS per 100 ml		5-DAY BOD	S O L I D S			ANIONIC DET.		PHENOLS in ppb
			TOTAL	FAECAL		TOTAL	SUSP.	DISS.	as ABS		
BOB 50.22 W	Submerged Storm sewer outfall to creek just west of Queen St.	July 10				NO	OBSERVED	FLOW			
BOB 50.27 W	Storm sewer outfall to Cr. at foot of Civic St.	July 10	3800	2400		SAMPLE	BROKEN	IN LAB.	ACCIDENT		
BOB 50.54 D	Ditch draining to the east bank of Brennan Creek at Annie Street	July 10	11,000+	11,000+	14.0	1,000	30	970	1.0		6
BOB 50.92	Brennan Creek upstream from Killaloe Station	July 9	70	38	1.6	180	5	175	0		0
BOBXZ 0.20D	Improved ditch draining to tributary of Brennan Cr. at Roche Street	July 11	240	72	1.2	270	5	265	0		0
BOBXZ 0.35D	Improved ditch draining to tributary of Brennan Cr. at pond outlet	July 11	1500	4	2.0	290	5	285	-		6
BOBY 0.28 D	Improved ditch draining to creek at King Street	July 11	20,000	7,500	4.0	1110	10	1100	0.1		0

All results except phenols reported in ppm unless otherwise noted.

TABLE 2

VILLAGE OF KILLALOE STATION

APPENDIX "A"

WATER POLLUTION SURVEY - RESULTS OF NUTRIENT ANALYSES

1949

Sample Point No.	Description	Date	Nitrogen as N				Phosphorus as P	
			Free Ammonia	Total Kjeldahl	Nitrite	Nitrate	Total	Soluble
BOB 48.87	Brennan Creek downstream from Killaloe Station at Henry Street Launching area	July 9	0.08	0.50	0.007	0.03	0.05	0.03
BOB 50.1	Brennan Creek at Cameron Street	July 10	0.20	3.0	0.06	0.24	0.10	0.02
BOB 50.2	Brennan Creek at Queen Street	July 10	0.20	1.1	0.04	0.06	0.04	0.01
BOB 50.92	Brennan Creek upstream from Killaloe Station	July 9	0.04	0.73	0.028	0.03	0.04	0.03

All results reported in ppm

APPENDIX "A "

TABLE 3

VILLAGE OF KILLALOE STATION

WATER POLLUTION SURVEY-WELL SAMPLE RESULTS

NAME	LOCATION	DATE	TYPE	COLIFORMS per 100 ml	HARDNESS	ALKALINITY	IRON	CHLORIDE	pH at	FLUORIDE
				TOTAL	FAECAL	as CaCO ₃	as CaCO ₃	as FE	as CL.	LAB. as F
J. Cybulski	Roche St.	July 10	Dr	0	0	217	162	0.35	11	7.9 0.2
Town Hall	Civic St.		Dr	0	0					
F. Sullivan	Henry St.		D	0	0	116	41	0.05	38	6.9 0.1
R. McElhinney	Lisk St.		Dr	0	0					
W. Okum	Queen St.		Dr.	Broken in transit						
S. Vasiloff	Ryan St.		D	0	0					
T. Coulas	Ryan St.		D G	11,000	450					
D. Ashford	Roche St.		Dr	5	0					
Mrs. M. Dwyer	Boland St.		Dr	0	0					
F. Andrechek	Coll St.		-	65	16					
Summers Garage	Queen St.		-	0	0					
Mrs. R. Grace	Mill St.	July 11	Dr	-	L4	146	102	0.05	33	6.9 0.3
Post Office	Queen St.		Dr.	0	0					
E. Cybulski	Lake St.		Dr	0	0					
R. Lymburner	King St.		-	0	0					
H. Hartwig	Angus St.		D	34	0					
A. Hartwig	Queen St.		Dr	0	0					
D. Felhaber	Civic St.		Dr	0	0					
R. Ristow	Queen St.		D	90	0	268	194	0.35	28	7.6 0.1

G and L mean greater and less than.

Dr means drilled.

D means dug.

All results except pH reported in ppm unless otherwise noted.

APPENDIX "B"

TABLE I

Significance of Laboratory Analyses

Bacteriological Examination

The presence of coliforms indicates pollution from human or animal excrement, or from some non-faecal forms. The objective for surface water quality in Ontario is a maximum of 2400 organisms per 100 millilitres.

The OWRC Laboratories employ the Membrane Filter (MF) technique of examination to obtain a direct enumeration of coliform organisms. The Department of Health Laboratories use the Most Probably Number (MPN) enumeration and coliform counts are reported as Total Coliform Organisms (TC) and Faecal Coliform Organisms (FC).

Sanitary Chemical Analyses

Biochemical Oxygen Demand (BOD)

Biochemical Oxygen Demand is reported in parts per million (ppm) and is an indication of the amount of oxygen required for the stabilization of decomposable organic or chemical matter in water. The completion of the laboratory test required five days, under the controlled incubation temperature of 20° Centigrade.

The OWRC objective for surface water quality is an upper limit of four (4) ppm.

Solids

The value for solids, expressed in parts per million

(ppm) is the sum of the values for the suspended and the dissolved matter in the water. The concentration of suspended solids is generally the most significant of the solids analyses with regard to surface water quality.

The effects of suspended solids in water are reflected in difficulties associated with water purification, depositions in streams and injury to the habitat of fish. Where suspended solids values are less than 20 ppm, laboratory difficulties are experienced and the turbidity is determined instead.

APPENDIX "B"

TABLE II

Nitrogen

Ammonia Nitrogen (Free Ammonia) is the soluble product in the decomposition of nitrogenous organic matter. It is also formed when nitrates and nitrites are reduced to ammonia either biologically or chemically. Some small amounts of ammonia, too, may be swept out of the atmosphere by rain water.

The following values may be of general significance in appraising free ammonia content: Low 0.015 to 0.03; moderate 0.03 to 0.10 ppm; high 0.10 or greater.

Total Kjeldahl is a measure of the total nitrogenous matter present except that measured as nitrite and nitrate nitrogens. The Total Kjeldahl less the Ammonia and organic nitrogen determinations are important in determining the availability of nitrogen for biological utilization. The normal range for Total Kjeldahl would be 0.1 to 0.5 ppm.

Nitrite Nitrogen

Nitrite is usually an intermediate oxidation product of ammonia. The significance of nitrites, therefore, varies with their amount, source and relation to other constituents of the sample, notably the relative magnitude of ammonia and nitrate present. Since nitrite is rapidly and easily converted to nitrate, its presence in concentrations greater than a few thousandths of a part per million is generally indicative of active biological processes in the water.

Nitrate Nitrogen

Nitrate is the end product of aerobic decomposition of nitrogenous matter, and its presence carries this significance. Nitrate concentration is of particular interest in relation to the other forms of nitrogen that may be present in the sample. Nitrates occur in the crust of the earth in many places and are a source of its fertility.

The following ranges in concentration may be used as a guide. Low, less than 0.1 ppm; moderate, 0.1 to 1.0 ppm; high, greater than 1.0 ppm.

Phosphorus

Total Phosphorus

Total phosphorus is a measure of both the organic and inorganic forms of phosphorus present.

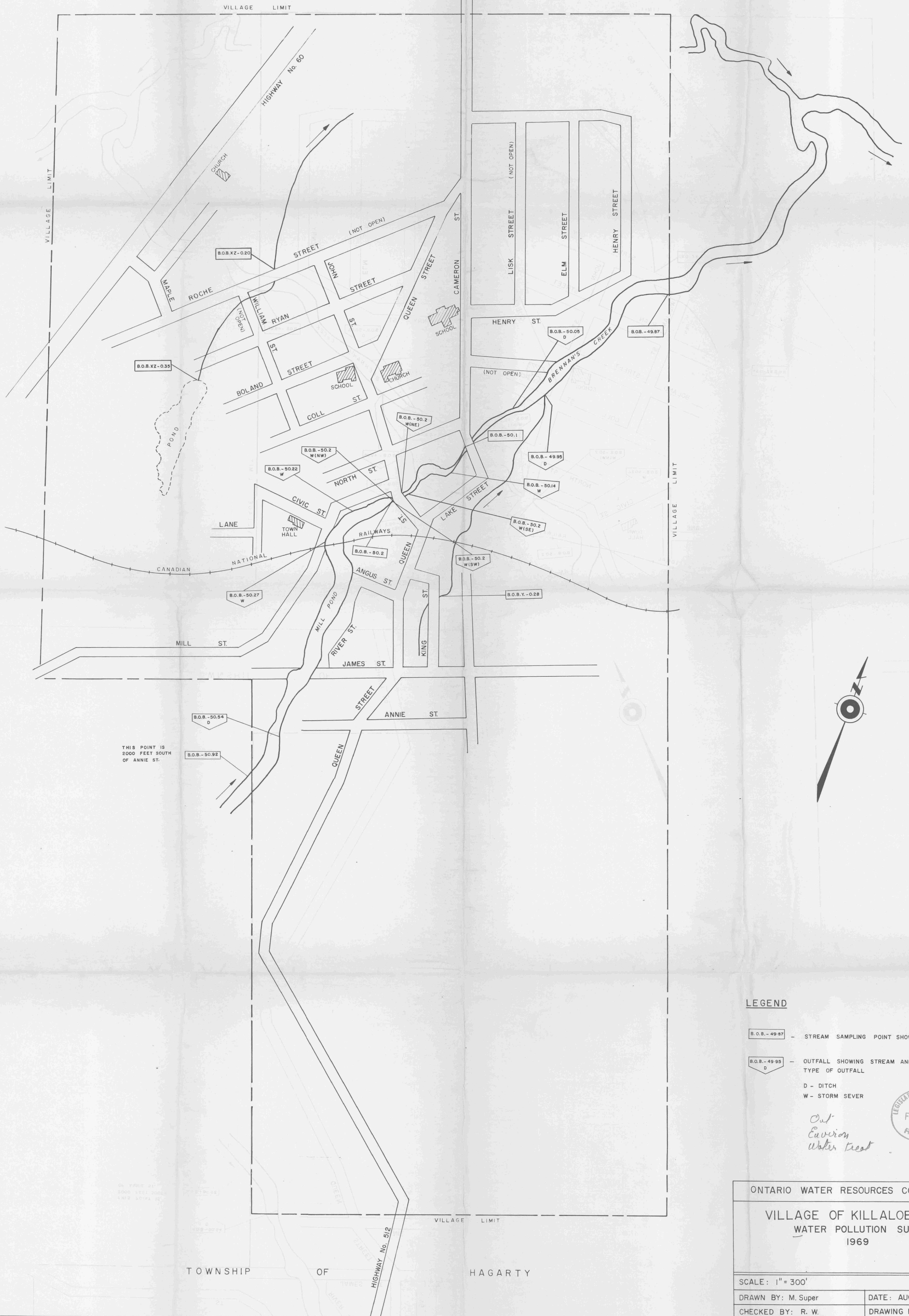
Soluble Phosphorus is a measure of the orthophosphate only and when subtracted from the total phosphorus given an indication of the concentration of organic phosphorus present. That is, the soluble phosphorus is a measure in the form of polyphosphate, which, however, in surface waters is usually insignificant. Inorganic phosphorus in concentration in excess of 0.01 ppm may cause nuisance conditions.

Anionic Detergents (ABS)

The presence of anionic detergents as ABS is an indication that domestic waste is present.

Phenols

The presence of phenol or phenolic equivalents is generally associated with discharges containing petroleum products, or with wastes from some industries. It is generally conceded that adequate protection of surface waters will be provided if the concentration of phenols in waste discharges does not exceed 20 parts per billion (ppb). Phenolic type waste can cause objectionable conditions in water supplies and might taint the flesh of fish.



LEGEND

- B.O.B.-49.87 - STREAM SAMPLING POINT SHOWING MILEAGE
- B.O.B.-49.95 - OUTFALL SHOWING STREAM AND MILEAGE
- D - DITCH
- W - STORM SEWER

Out
Environment
Water Dept



ONTARIO WATER RESOURCES COMMISSION

VILLAGE OF KILLALOE STATION
WATER POLLUTION SURVEY
1969

SCALE: 1" = 300'	
DRAWN BY: M. Super	DATE: AUGUST, 1969
CHECKED BY: R. W.	DRAWING No: 69-103-DE.

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